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HENRY SKINNER
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ENTOMOLOGICAL NEWS

VOL. XLII. OCTOBER, 1931 No. 8

Sub-sub-Specific Names in Lepidoptera.

A. GLENN RICHARDS, JR.,
Entomology Dept., Cornell University, Ithaca, New York.

In the NEWS for November and December, 1930, pages 298-302, 324-328, an article on the naming of individual variants in Lepidoptera by Mr. A. B. Klots appeared, which may be briefly summarized as showing the untenability of Gunder's system of classification within the species and giving a substantiated argument as to why "Scientific names should not be applied to any concept lower than subspecies". More recently (ENT. NEWS, March, 1931, pages 80-82) Mr. Talbot has written on the same subject in these pages, and agrees wholeheartedly with the point as to the untenability of Gunder's system, but would not go so far as to second the latter statement. He adds more examples as to the inadvisability of aberrational or "transition form" names, but beyond this would not be inclined to go. And then concludes, "A name should be given to any specimen or specimens which show definite differentiating characters, provided these characters are not of a teratological or pathological type," but "If the requisite data be not available, the classification of the new form must remain *sub judice*."

In other words, Mr. Talbot would put such work upon a breeding basis when possible, and then, if the character is not "teratological or pathological", would name it regardless of what its true nature is, so long as he thinks such a name might be of convenient use.

Let us glance at this for a moment from a genetic point of view, as Mr. Klots has done, and see if that will help us any. There are the well-proven Mendelian characters (which seem

so repulsive to some who apparently know nothing about them). First there are the simple Mendelian characters or factors or combinations of them; second there are lethals, linked lethals, sex-linked lethals and partial lethals or teratological factors — all of which would certainly come within the scope of "pathological types"; third we may have sex-linked characters which travel criss-cross in heredity; fourth sex-limited characters which are transmitted equally by both sexes but expressed in only one; and other types which we need not consider here. These types all have the same biological basis, though in outward appearance they may seem quite different.[1]

How does this affect the question? In the first place many of our "forms" are seasonal, which means only a certain type of environmental effect—not heritable—and no more deserving a "scientific name" on biological grounds than say chrysalis burns. Secondly many of our forms are merely sex-linked, sex-limited, or even simple Mendelian characters or combinations thereof, and as such should not be given scientific names.

Seasonal forms have been dispensed with; mimetics usually go in one of these—at least those which have been investigated genetically (that is mimetic forms within a normally non-mimetic or polymorphic species), and are frequently sex-limited; local forms however, present a somewhat different situation for there is every gradation from "field forms" (species which differ slightly and rather constantly from one field to the next) to local forms and to races of great distribution with or without sharp boundaries. The boundary must be arbitrary here regardless of the point. No one would want a name for every field and glen, yet I think everyone would agree that names for the great races are of use. It seems to me that the best place to draw a line here is between the great regional races.

Thus we have disposed of most, at least, of the forms lower than subspecies on a biological basis, and leave their naming to the equally arbitrary and highly specialized genetical nomen-

[1] Sex-linked lethals would be quite a stumbling block here, because while technically "pathological" in Mr. Talbot's sense, they would not appear so, and would make themselves manifest only by the disturbed sex ratio.

clature which is much better fitted to handle them; or for environmental forms to simple descriptive phrases which seem to me much more satisfactory. It is noteworthy that many of the forms which Mr. Talbot would retain have the same biological basis as the aberrations, "teratological and pathological" forms which he would discard.[2]

But is this the standpoint from which he is viewing the subject? There are some who would say that any form which is sufficiently different to cause any possible confusion should be named, and many of these referred to above would be such (including aberrations); or that any form which may need to be specially referred to from time to time should have a name. Such a nomenclature is not a *scientific* one; it is one of *convenience*. And so to adopt either standard we must use either a biological or a convenience basis. On dead specimens a biological basis is impossible, except perhaps in some cases by analogy with well-known related forms. Shall we make of nomenclature purely a tool, and adopt the convenience basis? or shall we give our nomenclature a biological basis?

Before finally committing myself, I would like to draw attention to Mr. Talbot's parting point, "If the requisite data be not available the classification of the new Form must remain *sub judice*". This is a definite commitment to the convenience form of nomenclature, and means, in short, that, whenever a specimen comes to hand which will not fit conveniently into the present set of names, it should be named, and left for future workers to retain or discard when the data are obtained. This is the usual procedure in description from single specimens, but for forms within the species would it not be better to let such specimens go nameless until something is known about them? For if, as is often the case, this "form" never reappears, then there is another name which will clutter lists forever, though it is useless and perhaps baseless.

Let us glance for a moment at other fields to see how such

[2] It might be worth noting in passing that intermediates in and of themselves mean nothing. It is only when genetical data concerning the nature of this intermediacy are available that they become intelligible. (See Morgan, T. H. "A Critique of the Theory of Evolution". Princeton Univ. Press, 1916, or any of the standard texts.)

cases are treated. Mr. Talbot draws a comparison with mammals which I am inclined to think would discourage subspecific names. But let us look still further afield into the other phase of biology, Botany, and see what is the general custom in such matters. From my acquaintance with the field, backed by some botanical friends, I would say that the practice today is not to name such forms, but to include them in the general discussion. Yet the analogues of all these we have been considering exist among plants (except possibly mimicry), and botanists get along quite satisfactorily without *scientific names* for them.

With these two bases before us, which shall we adopt? Some may be inclined to look for a compromise, but such a plan would be practically impossible to apply and, due to personal opinion, would leave things in about as bad a muddle as they are now. And so it seems to me that the best method would be to use the biological basis below subspecies, and to agree with Klots that "Scientific names should not be applied to any concept lower than subspecies".

In discussions dealing with these forms, or for recording of data, they might then be referred to much as the geneticist refers to his characters today, or for environmental effects by a phrase designating the effect (spring form, wet form, etc.). The results of such a system would be a much simpler tool (nomenclature), and as good, or I think better, handling of these forms with a consequent better understanding of their real nature. We are all agreed, however, that Gunder's system in untenable, and that aberration or "transition form" names should be abolished as such. Therefore we hope that rulings made by made in the near future to cover this point.[3]

[3] Attention might be called to the loose appellation of insects as among the "lower groups of organisms" from an evolutionary standpoint. One commonly thinks of them as lower than the Vertebrates, but in any discussion involving evolution thus to place such a specialized group not at all ancestral to the "higher forms" is not good. Some of them are "low" without doubt, but many of them are quite as highly specialized as any mammal, and the particular order under consideration is among the higher ones. Even such a "low" insect as a cockroach is known far back into geologic times with little change. The difference in length of life cycle is important in this connection, but it is not because insects are "lower organisms".

A New Sarcophaga from South Carolina (Diptera: Sarcophagidae).

By DAVID G. HALL, Asst. Entomologist, U. S. Bureau of Entomology, Charleston, South Carolina.

Among the species of *Sarcophaga* which are rarely found in collections and uncommonly taken in the field are those having three posterior dorsocentral bristles, the genital segments black, and the hind tibia of the male without villosity. Of these, only ten species and one variety have been described from North America, two from Europe, and two from Asia. The following species herein described belongs to this group.

Sarcophaga nox, n. sp.

♂. Head; front 0.227 of the head width (average of three specimens: 0.208, 0.208, 0.227); height,* 10, length at the antennae, 9, length at the vibrissae, 8; parafrontals and parafacials silvery gray pollinose, slightly golden above, the former with a single row of rather long bristles below near eye; frontal bristles about 8 in number, diverging rapidly below in the lower two or three; outer verticals developed; orbitals absent. Antennae black, third joint hardly twice second, reaching two-thirds the distance to the vibrissae which are normal and at the oral margin; arista with short plumosity for about half its length; palpi and proboscis black, ordinary. Bucca about one-fifth the eye height, with numerous black hairs, none pale before the metacephalic suture; back of head with two distinct rows of post-ocular ciliae, a few pale hairs about the middle and below; metacephalon a little elongated.

Thorax: Only slightly grayish pollinose, with the usual three to five black stripes which are not apparent; posterior dorsocentral bristles three; anterior dorsocentral bristles two; anterior acrostichal bristles only slightly larger than surrounding hairs; prescutellar bristles one; sternopleurals three; propleura bare; scutellum with two marginal and no preapical nor apical bristles.

Abdomen: Very dark, slightly grayish pollinose with three faint stripes, tessellated, the third and fourth segments slightly golden pollinose; second and third segments with medium marginal bristles, fourth with a row of about twelve; fifth sternite

* The height of the head in comparison with the length of the head at both the antennae and vibrissae, in units of one. This, if given, will satisfactory yield an impression of the head shape, a point that separates such divergent genera as *Amobia* and *Brachycoma*.

divided, heavily chintinized, black, the inside edges with numerous long hair and abundant golden pile. Hypopygium black; first segment large, rounded, with a slight covering of golden pollen, a row of about 7 long bristles on the posterior edge; several scattered bristles and numerous hairs; second segment small, short, with scattered hair and bristles; forceps black with numerous hairs behind, blunt, tips truncated; accessory plate dull orange with numerous scattered hairs; genital features as illustrated in Fig. 1.

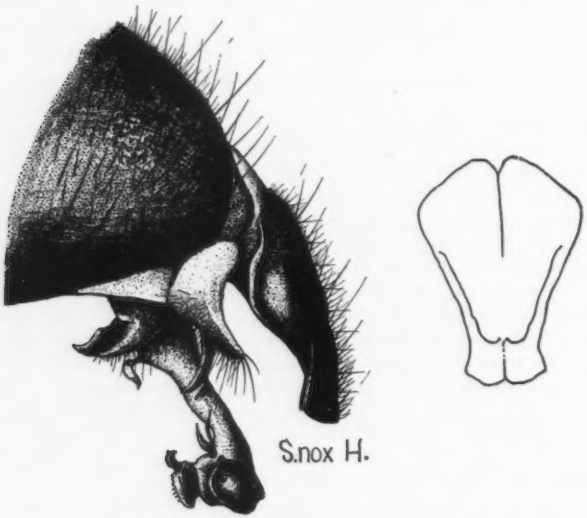


Fig. 1.—*Sarcophaga nox* Hall. Left lateral view of male hypopygium and rear view of forceps.

Wings somewhat darkened; first vein bare, third with several setulae; costal spine developed; third costal segment about three-fifths as long as fifth.

Legs black; hind tibia without villosity; middle femur without comb; middle tibia with two long and one short anterodorsal bristles.

♀. Head; front, 0.308 of head width in the single specimen; the parafacials and parafrontals slightly less pollinose than in the male; the thorax and abdomen more grayish, the stripes on the thorax more apparent; chaetotaxy as in the male except for the usual female characteristics. Genital segments black.

This species superficially resembles *S. pulla* Ald., which belongs to the provisional "A" group, in nature, owing to the dark color and lack of pollinosity. It goes to Couplet 5, Group C, p. 95, in Aldrich, 1916, Sarcophaga and Allies, but is separated from *S. fletcheri* Ald., the first of the two species indicated in the couplet, by the general lack of pollinosity, and from the second, *Xenoppia hypopygialis* Townsend, by the lack of a single bristle or macrochaeta on the lower parafacial.

Male holotype and female allotype No. 43315, U. S. National Museum.

Described from three males and one female collected November 18 and 19, 1930, in the sand dunes about 200 feet from the shore line of the Atlantic, at Folly Beach, Charleston, SOUTH CAROLINA, by Mr. F. J. Krueger and the author, and one male collected at Mayport, FLORIDA, March 25, 1931, by the author. The males were collected upon foliage, and the female upon a wooden box which contained decaying meat.

Another Entomological Society.

I would like to add another entomological society to the list in the May number of the NEWS.

THE CALIFORNIA ENTOMOLOGICAL CLUB, composed of Government, State, county, university, and commercial entomologists residing in northern California was organized April 25, 1930, at Sacramento, Calif. Stewart Lockwood of the State Department of Agriculture was elected president, Prof. E. O. Essig of the University of California vice-president, and Dr. H. E. Burke of the United States Bureau of Entomology secretary-treasurer. Sixty-one signed the roll as charter members.

The officers for 1931 are Prof. E. O. Essig, president; A. J. Flebut of the California Spray-Chemical Co., vice-president; Dr. H. E. Burke, secretary-treasurer. There are 136 active members, 0 corresponding members and 0 honorary members. —H. E. BURKE, Secretary-Treasurer, Forest Insect Laboratory, Stanford University, California.

Dr. A. B. Klots at Rochester, New York

DR. ALEXANDER B. KLOTS, of Cornell University, has accepted a position with Ward's Natural Science Establishment as head of the entomological department. He will also be an associate in entomology at the University of Rochester.—*Science*, August 14, 1931.

A New Species of Hesperiidae from Jamaica, British West Indies.

By E. L. Bell, Flushing, New York.

Choranthus lilliæ new species.

♂. *Upperside.* Primaries, costal margin from cell-end to base, cell, basal area and basal two-thirds of inner margin below vein I, deep fulvous; an oblique band of three discal spots of the same color, a little paler, between veins 1-2, 2-3, 3-4, the lowest spot the longest, and all slightly excavate on the outer edge; three elongate subapical dashes, followed by two similar ones in interspaces 9 and 10, all of the same color; apical area and outer margin broadly black; a thin, black, longitudinal line through the center of the cell; veins black; an oblique, narrow, grayish-black stigma of two parts, below the cell, the first part from just below and outside the rise of vein 3 to vein 2, the second part continued obliquely inward from vein 2 to vein 1; the narrow space between the stigma and the cell is black.

Secondaries, deep fulvous crossed by black veins, the costal and outer margins broadly black, the black outer border projecting inwardly between veins 1 and 2; long fulvous hairs extend over the cell and basal three-quarters of the wing from vein 2 to the abdominal fold.

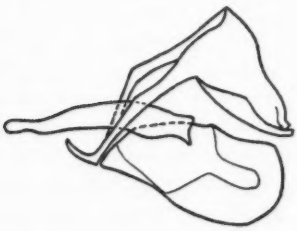
Beneath. Primaries, base black below the costal vein, extending outward to a point below the end of the cell; costal margin as far as the end of the cell and the outer half of the cell, deep fulvous; the three discal spots repeated, the two upper ones slightly paler than above and the lower one yellowish; apical area red-brown; lower half of the outer margin and the inner margin black. Secondaries, red brown, a large black spot at the anal angle; a hazy, ill-defined accumulation of paler scales forming a short discal band of three spots, which may be absent; a pale, ill-defined spot in the end of the cell.

Fringes of primaries fulvous at the anal angle, black above, sometimes with a few fulvous hairs intermixed; of the secondaries fulvous, sometimes with a few black hairs at the end of the veins and at the outer angle. Thorax above, fulvous-brown with a greenish reflection; beneath fulvous. Abdomen above, basally the same as the thorax, becoming deep fulvous toward the apex and on the sides; beneath sordid whitish. Legs fulvous. Head and collar greenish with a small yellow spot at the base of the antennæ and behind the eyes. Palpi yellowish intermixed with black, especially toward the tip; the

tip black. Pectus yellowish-fulvous. Antennæ black above; beneath yellow with black joints; the club yellow; apiculus black. Eyes black.

Expanse: 36 to 40 mm. (Center of thorax to apex of primary x 2.)

Type material: nine males from the upper part of the gorge at Bath, St. Thomas Parish, Jamaica, B. W. I. *Holotype male,* April 4th, 1931, deposited in the American Museum of Natural History, New York City; *one male paratype,* April 6th, 1931, in collection of the British Museum, London, England; *one male paratype* April 6th, 1931, in collection of the Academy of Natural Sciences, Philadelphia, Penna.; *one male paratype,* April 1st, 1931, in collection of the U. S. National Museum, Washington, D. C.; *five male paratypes,* April 1st, 4th, 5th, 1931, in collection of the author.



Choranthus lilliae, ♂ genitalia.

The figure of the genitalia is from one of the paratypes.

This handsome species is named for Miss Lilly G. Perkins, of Claremont, Jamaica, B. W. I., whose zeal in collecting has added much to the knowledge of the insect fauna of that island.

During a visit to Jamaica, in March and April, 1931, the writer collected the specimens here described, in the gorge above the Baths of St. Thomas, at Bath. They were found in a very restricted area on the bank of the small stream that flows through the gorge. With one exception they were found only in the morning and but one or two at a time, four being the most for any one day. They did not visit any of the flowers, but rested on the leaves of low vegetation. Although the steep sides of the gorge were thoroughly searched in the vicinity of where they were found, not a single individual was seen anywhere but in this one small place. No females were found.

This species is larger than *Choranthus haitensis* Skinner and *Choranthus radians* Lucas, and has a much darker ground color

and more prominent black veins than either of those species. On the under side it differs from *haitensis* in the broad black border of the primaries and the dark red-brown color of the secondaries with the prominent black anal spot; from *radians* it differs on the under side in the ground color and the lack of the pale veins.

Cerambycinae from Kartabo, Bartica District, British Guiana (Coleop.)

By SAMUEL H. WILLIAMS, University of Pittsburgh.

In the joint collections of the writer and the New York Zoological Society, the Cerambycinae are represented by twenty-five genera, and thirty-seven species. Additional species taken at other places in British Guiana are not included in this list, which is only a contribution to the Kartabo fauna, which has been so intensively studied by Dr. William Beebe and his associates. Material collected in the hinterland of British Guiana and in the other Guianas indicates a wide diversification and distribution of coleopterous insects in the region between the Amazon and Orinoco rivers, with a localization of certain species, and an extensive range characterizing others. Most of the work done in this region has been more or less scattered with the emphasis having been placed on Central American, Amazonian and Cayenne[1] faunae. British Guiana connects these regions and offers untold possibilities in distributional studies.

The writer has spent considerable time in an attempt to make an intensive, systematic survey of the Coleoptera of the lower jungle area in British Guiana and in an endeavor to obtain some information as to the effects of altitude on the general distribution of species. Specimens collected between the coastland and Mt. Roraima, which is a considerable distance back of Kaieteur Falls, show that some of the species taken at Kartabo are quite generally distributed, while other species are confined to the narrow strip of dense jungle along the coastal lowlands.

[1] French Guiana.

Within certain species, having a wide range, there seems to be considerable variation and in one or two cases the identities listed here are not absolutely certain. There is some justification for creating varieties and subspecies but, inasmuch as the types were not available and because of the fact that the original descriptions are frequently so inadequate, the observed differences do not appear to the writer as being of sufficient value for the creation of new species. To avoid additional synonyms, the writer has decided to allow the listed identities to stand until the opportunity is presented to compare the specimens with more examples, although the identified list has already been checked against collections in England, Germany, France, Austria, and Czechoslovakia.

Studies in this section of South America reveal the need of monographic works on the numerous genera described from the region. Most of the generic descriptions are contained in very early works which are not accessible to the average student and the lack of generic keys makes it necessary to plough through endless volumes of descriptions in order to properly locate collected specimens. In the numerous museums visited by the writer, myriads of Coleoptera collected in South America are not identified. To assume that the majority of these are new species would be a serious mistake, because, while the fauna is large, much work on the beetles of the region has been done by Olivier, Fabricius, Thomson, Serville, Chevrolat, Gounelle, Bates and others.

As indicated in previous papers on the Coleopterous fauna of British Guiana by the writer,[2] the present list is not presented as complete but is given only as a contribution to our knowledge of the Kartabo region.

British Guiana is a fertile field for investigations. The pleasure of studies in the magnificent jungles is greatly en-

[2] Williams, Samuel H.—A List of Prionid Beetles Taken at Kartabo, Bartica District, British Guiana with the Description of a New Species. Annals of the Carnegie Museum, Volume XIX, Number 2, 1929.

The Cicindelidae at Kartabo, Bartica District, British Guiana.—ENT. NEWS, Volume XL, Number 6, June 1929.

Eine Neue Oreodera Art aus Sudamerika. Deutsch. Entom. Zeitsch. heft 3 1928.

hanced by the cooperation of the public-spirited officials of the country and the Department of Science and Agriculture which incorporates a staff of well-trained and broadminded scientists of the highest character.

The writer wishes to thank Professor Dr. Ferdinand Pax of The Zoologisches Institut und Museum der Universität in Breslau; Professor Doctor H. Kuntzen of the Zoologisches Museum in Berlin and Doctor W. Arndt of the Berlin Museum, for their assistance in securing necessary literature. He is also indebted to Mr. G. K. Arrow and Major Austen of the British Museum for courtesies extended. The New York Zoological Society collections were made available through the kindness of Dr. William Beebe, from whom the writer has been the recipient of many friendly favors.

The nomenclature used in this list is according to the Junk-Schenkling Catalogus Coleopterorum, part 39, representing the list made by Aurivilius.

Family CERAMBYCIDAE.

Sub family CERAMBYCINAE.

Group II. DISTENIINI.
Genus Distenia Serv.
D. bicolor Thomson.

Group XI. ACHRYSONINI.
Genus Achryson Serv.
A. surinamum Linn.

Group XII. TORNEUTINI.
Genus Torneutes Reich.
T. lansbergei Thoms.

Group XIV. CERAMBYCINI.
Genus Hamaticherus Serv.
H. batus Linn.
H. castaneus Bates.
H. lacordairei Gah.
H. plicatus Oliv.
H. rugosus Oliv.
Genus Sphallenum Bates.
S. robustum Bates.

Group XV. HESPEROPHANINI. Genus Chlorida Serv.
C. festiva Linn. An extremely abundant species attracted to lights at night. Of the hundreds of specimens of *Chlorida* taken, only one specimen of *C. denticulata* was found.
C. denticulata Buquet.

Group XVI. EBURIINI.
Genus Eburodacrys Thoms.
E. 6-guttata Lameere.
E. sex maculata Oliv.

Group XVIII. SPAHERIONINI. Genus Periboeum Thoms.
P. pubescens Oliv.

It is difficult to distinguish among several related genera here because of rather inadequate generic descriptions. Thomson's description of the genus *Periboeum* says "Thorax strongly

tubercled on the sides in both sexes, thinly clothed with long hairs. Antennae hairy, with distinct spines externally at the end of each segment and with two spines on the terminal segment, the external spine being the smaller. Femur swollen and club like, spineless and with a short peduncle at the base. Middle coxal cavities open on the outside. Femur and tibia smooth, more or less clothed with bristle-like or silken hairs."

Thomson states that the thorax carries a spine but in most species the structure is a conical tubercle, even in the types of this genus. Gounelle[3] insists that the above formula is too rigid for the members of the genus and indicates that certain species lack the two terminal spines on the antennae while others, although the elytra are smooth and shining, have the head, thorax and ventral side of the body covered with a thin pubescence.

Peribocum is apt to be confused with *Stizocera, Sphaerion* and *Nephalius*. It may be distinguished from these in the following manner:

(1) Middle coxal cavities closed on the outside, femur spiny —*Stizocera* Serv.

(2) Middle coxal cavities open on the outside, femur without spines—3.

(3) Elytra smooth and shining; thorax furnished on each side with a prominent tubercle in both sexes, rarely spiny —*Peribocum* Thoms.

(4) Sides of the thorax rounded and punctuated in the same manner at the sternum of the male, thin and tubercular in the male; antennae without or with very small and inconspicuous spines in the male —*Sphaerion* Serv.

(5) Thorax bearing a series of small conical tubercles on each side in both sexes, frequently without sexual punctuation; spines of the antennae longer and more numerous in the male —*Nephalius* Newman.

Genus Pantonyssus Bates.
P. nigriceps Bates.
Genus Mallocera Serv.
M. glauca Serv.
Group XX. IBIDIONINI.
Genus Ibidion Serv.
I. maronicum Thoms.
Group XXII. CALLIDIOPINI.
Genus Cylindera Newman.
C. flava Fab.
Group LVI. RHINOTRAGINI.
Genus Omata White.
O. elegans White.
Genus Acyphoderes Serv.
A. abdominalis Oliv.
Genus Odontocera Serv.
O. fasciata Oliv.
Group LXV. CALLICHROMINI.
Genus Callichroma Lat.
C. vittatum Fab.

[3] Gounelle—Listes des Cerambycides de la region de Jatahy, etat de Goyaz Brazil. Ann. Ent. Soc. France LXXVII, 1909.

C. auronicum Linn.
Group LXVI. CAMPSOCERINI.
Genus Orthoschema Thoms.
O. albicorne Fab.
Group LXIX. CLYTINI.
Genus Neoclytus Thoms.
N. rufus Oliv.
Genus Mecometopus Thoms.
M. jansoni Bates.
Group LXXV.
RHOPALOPHORINI.
Genus Cosmisoma Serv.
C. ammiralis Linn.
Group LXXVII.
HETEROPSINI.
Genus Chrysoprasis Serv.
C. auricollis Dalm.
C. festiva Serv.
Group LXXXIV.
STERNACANTHINI.
Genus Sternacanthus Serv.
S. undatus Oliv.
Genus Batus Thunb.
B. barbicornis Linn.
B. hirticornis Gyllh.
Genus Ceragenia Serv.
C. bicornis Fab.
Group LXXXV.
PTEROPLATINI.
Genus Pteroplatus Buquet.
P. lycoides Guer.
Group LXXXVII.
TRACHYDERINI.
Genus Trachyderes Dalm.
T. melas Bates.
T. succintus Linn.
T. bicolor Voet.

The collection will be placed at the disposition of the New York Zoological Society.

Oligolectic Andrenidae (Hymen.).

Lately Cockerell says: "Graenicher, in his Wisconsin list, catalogues five species of *Andrena* which gather pollen from *Salix*, ten from the Compositae, four from Umbelliferae, and one each from *Claytonia virginica, Hydrophyllum, Geranium maculatum, Fragaria,* and *Parnassia.*"

Graenicher (1905) gave a list of 13 species which were the same as those recorded in my local list of 21 species (1899) and added 11 species (2 erroneous and 2 doubtful). What he contributed to my list was one species from *Salix,* five from Compositae, one from Umbelliferae, and one each from *Fragaria* and *Parnassia.* And this list would not have been published if it had not been preceded by that of 1899.

My local list of local oligolectic bees (Ecology 7:378-9, 1926) shows 9 Andrenidae oligoleges of *Salix,* 8 of Compositae, and one each of Cruciferae, Umbelliferae, *Aruncus sylvester, Claytonia virginica, Geranium maculatum, Nothoscordum bivalve, Polemonium reptans* and *Viola. Andrena geranii* and *nasonii,* given in my first list, are not oligoleges of *Hydrophyllum* and Umbelliferae.—CHARLES ROBERTSON, Carlinville, Illinois.

Some Observations on the Biology of the Sarcophaginae (Diptera: Sarcophagidae).

By S. GRAENICHER, South Miami, Florida.

As stated by Dr. J. M. Aldrich [1] "the species of Sarcophaga range in larval habits from scavengers to parasites of warm-blooded animals". The species mentioned below [2] have been bred from dead animals and excrements exposed in the open in my immediate neighborhood, or from material picked up at random at various points in the Miami region.

Along with this part of the work, some feeding experiments have been carried on with the larvae of three of the species for the purpose of testing the tolerance of the larvae to various food substances upon which, so far as we know, they do not occur under natural conditions.

SPECIES BRED FROM DEAD ANIMALS AND EXCREMENTS.

From 8 rats: *Sarcophaga bullata* Park. from all 8, *S. sternodontis* Towns. from 3, *S. plinthopyga* Wied. from 1.

From 2 birds (quail & chick): *bullata* from both.

From 5 snakes: *bullata* from all 5, *sternodontis* from 2.

From 3 fish: *bullata* from all 3, *sternodontis* from 2.

From 2 marine snails (*Strombus gigas* and *Janthina fragilis*) exposed at South Miami: *bullata* from both—from a *Janthina fragilis* found on the beach at Miami Beach: *Sarothromyia femoralis* Sch. var. *simplex* Ald.

From 3 crustaceans (2 landcrabs, *Cardisoma guanhumi*, and 1 bluecrab, *Callinectes* sp.): *bullata* from 2 (landcrabs), *sternodontis* from 1 (bluecrab), *S. impar* Ald. from 1 (landcrab), *S. welchi* Hall from 3 (landcrabs and bluecrab).

From insects (a quantity of dead cockroaches, *Periplaneta australasiae* Fabr.): *bullata*.

From 2 dead myriapods (*Spirobolus* sp.): *sternodontis* from 1, and S. *singularis* Aldr. from 1.

From a dead whip scorpion (*Mastigoproctus giganteus*): *sternodontis*.

From rotten beef: *bullata, sternodontis* and *Sarcophagula occidua* Fabr.

From human excrement: *bullata* 3 times and *S. floridensis* Aldr. once. On three occasions human excrement deposited in privy vaults was found swarming with maggots from which *bullata* came forth.

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[1] J. M. Aldrich, Sarcophaga and Allies in North America, p. 16.

[2] My thanks are due Mr. David G. Hall, who has given me some valuable help in the identification of the material.

From dog excrement: *occidua* once.
With exposed chicken manure and cow manure no results were obtained.

From all of this material *bullata* was bred 27 times, *sternodontis* 11 times, *plinthopyga* once, *impar* once, *welchi* 3 times, *floridensis* once, *singularis* once, *femoralis* var. *simplex* once, *occidua* twice. It will be noticed that *helicis* Towns. (undoubtedly *rapax* Walk., according to Aldrich [3]) does not figure at all in these results.

According to the information contained in Aldrich's "Sarcophaga and Allies" *bullata* has been bred from carrion and dead fish, *sternodontis* from insects, *helicis* from dead and live insects, *plinthopyga* from carcasses (Bishopp), *impar* from insects (live pupae) and beef refuse, *singularis* from *Spirobolus* myriapod); no records for *floridensis, femoralis* var. *simplex* and *occidua*.

Plank [4] has found *sternodontis* to be the most important of the minor parasites of the sugar cane stalk borer, *Diatraea saccharalis* Fabr., in Cuba. It has been reared from pupae and injured larvae. *Helicis* has also been obtained from the larvae of *Diatraea*.

The evidence on hand points to *bullata* as a most important scavenger with no parasitic leanings whatever, to *sternodontis* as a scavenger with pronounced parasitic tendencies, and to *helicis* as a scavenger on dead insects and a true parasite on live ones (also reared from a myriapod, *Spirobolus* sp.).

Feeding experiments with the larvae of helicis, sternodontis and bullata.

Since the Sarcophagidae deposit larvae instead of eggs, it is a comparatively simple procedure to press the larvae from the body of a female when the latter is ready to larviposit, as Allen [5] has done in his studies of the habits of *Senotainia*

[3] J. M. Aldrich, Notes on the types of Am. two-winged flies of the genus Sarcophaga, etc. Proc. U. S. Nat. Mus. *78*, Art. 12, pp. 1-39, pls. 1-3 (1930).
[4] H. K. Plank. Natural enemies of the sugar moth stalk borer in Cuba. Ann. Ent. Soc. Am. *22*, 621-640 (1929).
[5] H. W. Allen. N. Am. species of two-winged flies belonging to the tribe *Miltogrammini*. Proc. U. S. Nat. Mus. *68*, Art. 9, pp. 1-106, pls. 1-5 (1926).

trilineata. The larvae from 10 females of *helicis,* 11 of *sternodontis,* and 11 of *bullata* were used in these experiments. Identification of the species was based on the males of the offspring.

Helicis. From female No. 1: Fed up on decaying rat meat exclusively. Full development after 5 days; 2 male and 2 female adults on 22nd day.

From female No. 2: Given at first rat meat, later beef. Ready to pupate on 5th day. Adults on 23rd day.

From female No. 3: Fed for the first 3 days on beef with good results, for the next 24 hours on chicken manure with very poor results. From then on reaching a rapid and full development on 2 dead large cockroaches. Adults on 21st day.

From female No. 4: Fed like those from No. 3, with the same results.

The larvae from the remaining 6 females were brought to maturity either on decayed or fresh cockroaches (disabled by crushing the head), and no differences noted in the outcome.

In summing up the results with the larvae of *helicis,* it may be stated that they fed and thrived on the meat of warm-blooded animals (rat and beef) just as well as on fresh or decaying insects (cockroaches). Chicken manure is evidently not a proper kind of diet.

Sternodontis. Feeding experiments with the larvae were carried on in the same manner as with those of *helicis.* No noteworthy differences were observed, whether they were fed on meat from various sources (beef, rat and fish) or on fresh or decaying insects (cockroaches). Chicken manure was found to be entirely unsuitable; the larvae made poor headway and finally succumbed, not a single one reaching maturity. Duration of the larval and pupal stages from 15 to 18 days.

Bullata. As was to be expected in view of the known habits of this species, the larvae thrived on various kinds of decomposed meat, as also on fresh and putrid cockroaches. They developed normally on human excrement; my efforts, however, to bring them up on chicken excrement were entirely unsuccessful. Adults after 22 to 25 days.

Under natural conditions the larva of a *Sarcophaga* is restricted to the particular kind or kinds of food upon which it is deposited by the female, while in the feeding experiments

the larvae were given a wider range in their diet. The larvae of the three species under consideration showed a remarkable agreement in the acceptance and utilization of the various kinds of food substances offered them, irrespective of the differences displayed by the females in the selection of food for their offspring. Hallock [6] had a similar experience with *S. latisterna* Park., gravid females of which were confined in cages and offered larvae of the Japanese beetle; they failed to larviposit on these larvae, while maggots dissected from the abdomen of the fly, and placed on freshly killed larvae of the same beetle "fed rapidly, and developed normally."

Referring to the parasitism of *Sarcophaga*, Aldrich ("Sarcophaga and Allies," p. 246) states that we are dealing with a group, the habits of which are still more plastic than in the Tachinidae. Plasticity is evidently more pronounced in the larvae than in the adults, as indicated by the manner in which the former accept food substances differing in kind from those selected for them by the mother flies.

Mr. F. H. Benjamin at the U. S. National Museum.

MR. FOSTER H. BENJAMIN, who was for some years assistant to Dr. Barnes at Decatur, Illinois, has been transferred to the U. S. Bureau of Entomology and assigned to a position in the National Museum where he will devote most of his time to identification work on North American Lepidoptera. Mr. Benjamin has been for the last three years engaged in work on the Mexican orange worms and the Mediterranean fruit fly for the Plant Quarantine and Control Administration of the U. S. Department of Agriculture at Orlando, Florida.—*Science*, August 14, 1931.

A New Entomological Journal in South America.

Revista de Entomologia is the name of a new journal of which the first fascicle is dated April 25, 1931. It is under the editorship of Thomas Borgmeier, O. F. M., Caixa Postal 1302, Sao Paulo, Brazil, and subscriptions are received by Mario Autuori, at the same address. It is a quarterly, and the first fascicle contains 128 pages. The price is three dollars a year postpaid.

[6] H. C. Hallock. Notes on methods of rearing *Sarcophaginae* (Diptera) and the biology of *Sarcophaga latisterna* Park. Ann. Ent. Soc. Am. 22, 246-250 (1929).

The fascicle is handsomely gotten up, comparing favorably with the best European and other journals. The contributions are by Melzer, Bruch, Horn, Fonseca, Spitz, Autuori, Leuderwaldt and Townsend, and are in Portugese, Spanish, German and English, with incidental Latin. A single plate and numerous text figures are well printed. The article by Townsend is especially noteworthy, as it contains a resumé in 40 pages of the results of his examination of muscoid types in the European museums in 1928, as far as the American genera and species are concerned.

Father Borgmeier is to be congratulated on the fine appearance and excellent contents of this first number. The journal is worthy of the support of all entomologists who are not limited to "north of Mexico,"—a class which is happily increasing.—J. M. ALDRICH.

A New Entomological Journal in England.

The Council of the Entomological Society of London has decided to issue a new entomological journal, beginning in January 1932, in 12 parts per annum, entitled *Stylops, A Journal of Taxonomic Entomology,* under the editorship of S. A. Neave, M.A., D.Sc., as Secretary of the Society, assisted by F. W. Edwards, M.A., Sc.D.; A. D. Imms, M.A., Sc.D., F.R.S.; Sir Guy A. K. Marshall, C.M.G.; D.Sc., F.R.S., Martin E. Mosely, Hugh Scott, M.A., Sc.D., and W. H. T. Tams. The annual subscription to *Stylops* will be 24*s.*, or $6.00, post free, single parts 3*s.* each, but Fellows of the Society will have the right to subscribe for one copy at the special rate of 16*s* per volume. The journal is primarily designed to meet the demand for the prompt publication of short taxonomic papers. For this reason papers exceeding 10,000 words, or occupying more than 12 pages, cannot be accepted for it, and preference will be given to appreciably shorter ones. The Society is prepared to undertake the provision of a reasonable number of text-figures or plates when only line-blocks are required, though authors will be expected to supply the original drawings. In the case of half-tone or colour work, authors will also be required to pay for, or supply, the necessary blocks. Authors, who need not be Fellows of the Society, will be entitled to receive 25 copies of their papers free of charge and will be permitted to purchase additional quantities at a fixed scale. Papers in English, French or German may be submitted, but must be typewritten on one side of the paper only. Those desiring to offer papers should send them to the EDITOR, at 41 *Queen's Gate, South Kensington, London, S.W. 7.*

Entomological Literature

COMPILED BY LAURA S. MACKEY UNDER THE SUPERVISION OF E. T. CRESSON, JR.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

The numbers within brackets [ ] refer to the journals, as numbered in the list of Periodicals and Serials published in the January and June numbers (or which may be secured from the publisher of Entomological News for 10c), in which the paper appeared. The number of, or annual volume, and in some cases the part, heft, &c. the latter within ( ) follows; then the pagination follows the colon :

All continued papers, with few exceptions, are recorded only at their first installments.

*Papers containing new forms or names have an * preceding the author's name.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

☛*Note the change in the method of citing the bibliographical references, as explained above.*

Papers published in the Entomological News are not listed.

GENERAL.—Aaron, S. F.—The little wonder flies [Nat. Mag.] 18: 158-162, ill. **Barber, H. S.**—Traps for cave-inhabiting insects. [Jour. E. Mitchell Sc. Soc.,] 46: 259-266, ill. ***Carpenter, F. M., et al.**—Insects from the Miocene (Latah) of Washington. [7] 24: 307-322, ill. ***Carpenter, F. M.**—The lower permian insects of Kansas, Part 4. The order Hemiptera, and additions to the Paleodictyoptera and Protohymenoptera. [16] 22: 113-130, ill. ***Cockerell and LeVeque.**—The antiquity of insect structures. [90] 65: 351-359, ill. **Comstock, J. H.**—Obituary. By G. W. Herrick. [7] 24: 199-204, ill. **Crevecoeur, F. F.**—Obituary. By R. L. Parker. [103] 4: 76, ill. **Ewing, H. E.**—Some factors affecting the distribution of and variation in North American ectoparasites. [90] 65: 360-369. **Fage, L.**—Les Araignées cavernicoles. [Arch. Zool. Exp., Paris] 71: 99-291, ill. **Faulkner, P.**—Insects in English poetry. [76] 1931: 53-73. **Johnson, C. W.**—An interesting copy of Wiedemann's Diptera Exotica. [5] 38: 25-26. **Puri, D. R.**—Mimicry and protective colouration. [Bull. Dept. Zool. Panjab Univ.] 1: 53-56. **Robinson, W.**—The thermopile for temperature determinations in entomology. [7] 24: 417-423, ill. **Waldron, L. R.**—Insects as pollen carriers. [68] 73: 703. **Weiss, H. B.**—John Southall's "Treatise of Buggs". [6] 39: 253-258.

ANATOMY, PHYSIOLOGY, ETC.—Baumgartner & Payne.—"Intravitam" technic used in studies on the living cells of grasshoppers. [42] 59: 359-393, ill. **Buxton, P. A.**—The thermal death-point of Rhodnius (Heteroptera) under

controlled conditions of humidity. [Jour. Exp. Biol.] 8: 275-278, ill. **Chorine, V.**—Contribution a l'etude de l'immunité chez les insectes. [78] 65: 291-387, ill. **Eyer, J. R.**—The relation of temperature and rainfall to outbreaks of the grape leafhopper, Erythroneura comes. [7] 24: 238-259, ill. **Hadjinicolaou, J.**—Effect of certain radio waves on insects affecting certain stored products. [6] 39: 145-150. **Heberdey, R. F.**—Zur entwicklungsgeschichte, vergleichenden anatomie und physiologie der weiblichen geschlechtsausführwege der insekten. [46] 22: 416-586, ill. **Hilton, W. A.**—Nervous system and sense organs. [13] 23: 27-41, ill. **Janisch, E.**—Experimentelle untersuchungen über die wirkung der umweltfaktoren auf insekten. [46] 22: 287-348, ill. **Jodlowski, M. J.**—Ueber den histologischen Bau der spinndrüsen bei ameisenlarven. [100] 1930: 745-761, ill. **Kawaguchi, E.**—Ueber den dimorphismus der epithelzellen im mitteldarm der seidenraupe (Bombyx mori). [Jour. Dept. Agric. Kyushu Imp. Univ.] 3: 47-64, ill. **Klingstedt, H.**—Digametie beim weibchen der trichoptere Limnophilus decipiens. [Acta Zool. Fennica, Helsingforsiae] 10-11: 66 pp., ill. **Kratky, E.**—Morphologie und physiologie der drüsen in kopf und thorax der honigbiene (Apis mellifica [94] 139: 120-200, ill. **Marcu, O.**—Die stridulationsorgane der gattungen Aparapion und Rhinastus unter den Curculioniden. [34] 95: 331-333, ill. **Maziarski, M. S.**—Sur le tissu musculaire des insectes. III. Les réseaux musculaires (myosyndesmium) des gaines ovariques des Coléoptères. [100] 1930: 657-690, ill. **Maziarski, M. S.**—Sur le tissu musculaire des insectes. IV. Les éléments contractiles dans les couches musculaires de l'intestin moyen chez les Coléoptères. [Comptes Rendus Men. Classe Sci. Math. et Nat., Cracovie] 1931: 8. **Meyer, E.**—Ueber den blutkreislauf der ephemeriden. [46] 22: 1-52, ill. **Miczynski, M. K.**—Etudes génétiques du genre Aegilops. II. Morphologie et cytologie des hybrides interspécifiques. [Comptes Rendus Men. Classe Sci. Math. et Nat., Cracovie] 1931: 8-9. **Millot, J.**—Les glandes séricigènes des Dysdérides. [Arch. Zool. Exp., Paris] 71: 38-45, ill. **Minnich, D. E.**—The sensitivity of the oral lobes of the proboscis of the blowfly, Calliphora vomitoria, to various sugars. [42] 60: 129-131, ill. **Regen, J.**—Ueber den aufbau der stridulationslaute der saltatoren Orthopteren. [Sitzungber. Akad. Wissen., Wien] 139: 539-544. **Richmond, E. A.**—The external morphology of Hydrophilus obtusatus (Hydrophilidae). [6] 39: 191-250, ill. **Roubaud, M. E.**—Fatigue évolutive cyclique et lignées infatigables chez la mouche verte commune Lucilia sericata.

[69] 193: 204-205. **Saint-Hilaire, K.**—Ueber vorderdarmanhänge bei Lophyrus-larven und ihre bedeutung. [46] 21: 608-616, ill. **Spett u. Schaposchnikow.**—Die variabilitat des mannlichen und weiblichen geschlechts bei käfern. [46] 22: 121-162. **Stehr, W. C.**—The activating influence of light upon certain aquatic arthropods. [42] 59: 297-335, ill. **Verlaine, L.**—L'instinct et l'intelligence chez les Hyménoptères. [Mem. Soc. Ent. Belgique] 23: 191-222. **Willrich, U.**—Beiträge zur kenntnis der lichtkompassbewegung und des farbensinnes der insekten. [89] 49: 157-204, ill. **Zacwilichowski, M. J.**—Sur l'innervation et les organes sensoriels des ailes chez les insectes. [Comptes Rendus Men. Classe Sci. Math. et Nat., Cracovie] 1931: 10.

ARACHNIDA AND MYRIOPODA.—*Beier, M.—Neue pseudoscorpione der U. O. Neobisiinea. [Mitt. Zool. Mus., Berlin] 17: 299-318, ill. ***Roewer, C. F.**—Drei neue Cosmetiden (Opilioniden) aus Mexiko. [34] 95: 247-250, ill. **Thor, S.**—Das Tierreich . . . Lief. 56. Acarina. Bdellidae, Nicoletiellidae, Cryptognathidae. 87 pp., ill. **Verhoeff, K. W.**—Bronns Klassen und Ordnungen des Tierreichs. Bd. 5. Myriapoda. Diplopoda. 1675-1834, ill.

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ORTHOPTERA.—***Fulton, B. B.**—A study of the genus Nemobius (Gryllidae). [7] 24: 205-237, ill.

HEMIPTERA.—***Ball, E. D.**—Some new genera and species of leafhoppers related to Eutettix. [39] 15: 1-6. ***Ball, E. D.**—Some new genera and species of leaf-hoppers related to Mesamia. [19] 26: 91-95. **Beamer, R. H.**—Notes on the 17-year cicada in Kansas. [103] 4: 53-58, ill. **Beamer, R. H.**—Some Erythroneura (Grape leafhoppers) of the maculata group (Cicadellidae). [5] 63: 127-135. **Buys, J. L.**—Leafhoppers of Mt. Marcy and Mt. Macintyre, Essex Co., New York (Cicadellidae). [6] 39: 139-143. **China, W. E.**—An interesting relationship between a crayfish and a water bug. [Nat. Hist. Mag. London] 3: 57-62, ill. ***Drake & Harris.**—An undescribed water-strider from Brazil. [3] 20: 267-268. **Herrick, G. W.**—The magnolia scale (Neolecanium cornuparvum). [7] 24: 302-305, ill. ***Jaczewski, T.**—Die Corixiden (Corixidae, Heteroptera) Zool. Staatsint. u. Zool. Mus. Hamburg. [Mitt. Zool. Staatsinst. u. Zool. Mus. Hamb.] 44: 140-148, ill. (S). **Kemper, H.**—Beiträge biologie der bettwanze (Cimex lectularius). [46] 22: 53-120, ill. ***Lawson, P. B.**—Three new species of Acinopterus with notes on other species (Cicadellidae). [103] 4: 59-61. **Martin, R. S.**—Two new Euphyllura (Chermidae). [103] 4: 68-70. **Mills, H. B.**—Notes on the oviposition of Metapterus annulipes. (Reduviidae). [19] 26: 84, ill. ***Oman, P. W.**—Some new Neocoelidia with notes on other species. (Cicadellidae.) [103] 4: 62-68. **Wadley, F. M.**—Ecology of Toxoptera graminum, especially as to factors affecting importance in the northern United States. [7] 24: 325-395, ill.

LEPIDOPTERA.—Bonniwell, J. C.—Notes on Megathymus mariae. [3] 20: 264-265. **Bratley, H. E.**—Euvanessa antiopa. The mourning cloak. [39] 15: 7. ***Cassino, S. E.**—New Geometridae. [The Lepid.] 5: 17-24. **Clark, A. H.**—The extirpation of one butterfly by another. [Pop. Sci. Month.] Aug. 1931: 173-174. ***Clark, B. P.**—Descriptions of seven new Sphingidae and a note on one other. [Pro. New England Zool. Club] 12: 77-83. **Clayhills, T. H.**—Zur kenntnis der temperaturabhängigkeit der jährlichen abundanzkurven von Calymnia trapezina. [Mem. Soc. Pro Fauna et Flora Fennica] 5: 91-95, ill. ***Heinrich, C.**—Notes on and descriptions of some American moths. [50] 79, Art. 13: 16 pp., ill. (S). ***Holland, W. J.**—Notes on some

American butterflies mainly relating to classification and nomenclature. [3] 20: 255-264. **Klots, A. B.**—Notes on lepidoptera collected in a Connecticut-Rhode Island woodland. [19] 26: 57-70, ill. **Klots, A. B.**—Notes on some moths collected at Silver Lake, Chesham, New Hampshire. [5] 38: 36-37. ***Meyrick, E.**—Micro-lepidoptera from South Chile and Argentina. [An. Mus. Hist. Nat., Buenos Aires] 36: 377-415. **Pollard, C. L.**—Habits of South American equatorial butterflies. [6] 39: 167-170. **Pope, T. E. B.**—Collecting along the Yellowstone Trail. [Yr. Book Public Mus. Milwaukee] 1929: 36-68, ill. **Risbec, M. J.**—Un pentatome parasite de la Chenille épineuse du Cotonnier (Earias huegeli). [69] 193: 247-250. **Rockwood & Zimmerman.**—A seed caterpillar, Grapholitha conversana, on a native clover in the North Pacific region. [47] 43: 57-65, ill. ***Williams, R. C.**—Cuban Hesperiidae. [1] 57: 305-318, ill. **Wucherpfennig, F.**—Sammeltage im Urwalde am Rio Madeira. [18] 25: 100-105, ill.

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The Teaching of the Principle of Homologies to Elementary Classes in Biology, and the Use of Phylogenetic Series in the Laboratory. By J. Chester Bradley. School Science and Mathematics, Vol. XXXI, No. 5, pp. 525-532, 14 figs. May, 1931.

Those eminent expositors of the wing venation of insects, the late Professor Comstock and the living Professor Needham,

have found a successor in their pupil and associate in the Cornell faculty, Professor J. C. Bradley. Dr. Bradley believes that the wings of insects and their venation furnish "the most readily available and altogether satisfactory phylogenetic series that can be placed before all elementary students" of biology, "even in large laboratory sections." Needless to say he also regards their study as very essential to the future entomologist, and for both classes of students he has provided the laboratory manuals above cited. The plates show the actual venation of different insects printed in pale ink. The student, comparing these unlabeled plates with each other and using two or more colored inks or pencils, endeavors to mark the homologous veins with the same color or/and label them to show their homologies. Dr. Bradley rightly says: "If the student is obliged to work out the successive steps of modification with a minimum of guidance from the teacher and with no guidance from literature, except the directions in this guide, the whole course becomes analogous to a simplified research problem. . . . Experience shows that the student, led to work out the problems of the course in the way indicated, finds a compelling interest in their solution. Studied in this way, the work has a distinct value as training in clear and independent thinking." "The instructor should refuse to point out errors which the student is capable of discerning for himself. Compel the student to criticize his own work and discover all errors which are derived from carelessness or failure to apply logical deduction or critical analysis." While the two guides naturally contain directions to the student, the "Suggestions for the Instructor" give Dr. Bradley's own views on various disputed points in venational homologies and, consequently, nomenclature. Of the 67 loose plates (8 x 4¾ inches) accompanying the larger guide, 1 is a simplified neopterygote wing, 17 are Dipterous, 1 is Trichopterous, 7 Lepidopterous, 1 Mecopterous, 1 Plecopterous, 7 Neuropterous, 2 Corrodentine, 24 Hymenopterous, 1 of Palaeodictyoptera and Protephemeroidea, 2 Ephemerida, 3 Protodonata and Odonata. In a circular the publishers state that "Coleoptera, Orthoptera and Hemiptera are omitted, owing to the difficulties of their study and to the little practical use made of the venation in those orders." Nothing is said as to the possibility of purchasing this set of plates separately from the guide; we think this might often be desirable. This series of texts and figures seems to be well designed for the purposes for which it has been drawn up and we wish author and publishers all success.—P. P. CALVERT.

OBITUARY.

Father ERICH WASMANN, S. J., widely known for his writings on instinct and intelligence, psychology of ants and the relations of these insects to other animals, died on February 27, 1931, at St. Ignatius College, Valkenburg, in Southern Holland. He was born at Meran (Merano) in the southern Tyrol, May 29, 1859. An interesting account of his life, accompanied by a portrait of his later years, is given by Franz Heikertinger (Koleopterologische Rundschau, xvii, 89-96, July 31, 1931), from which we take these notes. After study in Benedictine and Franciscan schools, he entered the Jesuit order, September 28, 1875, at Exaten, near Roermond, Holland. It was at this time that the first symptoms of an affection of the lungs appeared, a disease which followed him throughout life and which, by his physician's prescription, that he spend much time out of doors, eventually led to his intensive study of ants. From 1890 to 1892 he studied zoology at the University of Prague under Hatschek and Cori. In 1893, again at Exaten, he became a co-editor of a journal of his order, *Stimmen aus Maria-Laach* (later *Stimmen der Zeit*), a position which gave him much time for scientific work. His publications include about 280 contributions to knowledge of myrmecophiles and termitophiles, one of the most valuable of which is his *Kritisches Verzeichniss der myrmekophilen und termitophilen Arthropoden* (Berlin, 1894). Among his more general works are *Instinkt und Intelligenz im Tierreich* (1897), *Vergleichende Studien über das Seelenleben der Ameisen und höheren Tiere* (1897), English translation, St. Louis, 1905, *Die psychischen Fähigkeiten der Ameisen* (1899, 2nd edit. 1909), *Das Gesellschaftsleben der Ameisen* (1915), *Die moderne Biologie und die Entwicklungstheorie* (English transl., London, 1910), *The Berlin Discussion of the Problem of Evolution* (London, 1909).

A *Festschrift* in honor of his 70th birthday was published as Volume 82 of the *Zoologischer Anzeiger*, 1929. It is accompanied by four portraits of Wasmann at different ages.

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This column is intended only for wants and exchanges, not for advertisements of goods for sale. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

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